An aerial photograph showing a large, irregularly shaped lake with a smaller lake connected to its western side. The surrounding land is a mix of dense green forest and some cleared areas, likely agricultural fields. The sky is a clear, deep blue. The text is overlaid in white with a drop shadow.

The Glen Lake Area Watershed

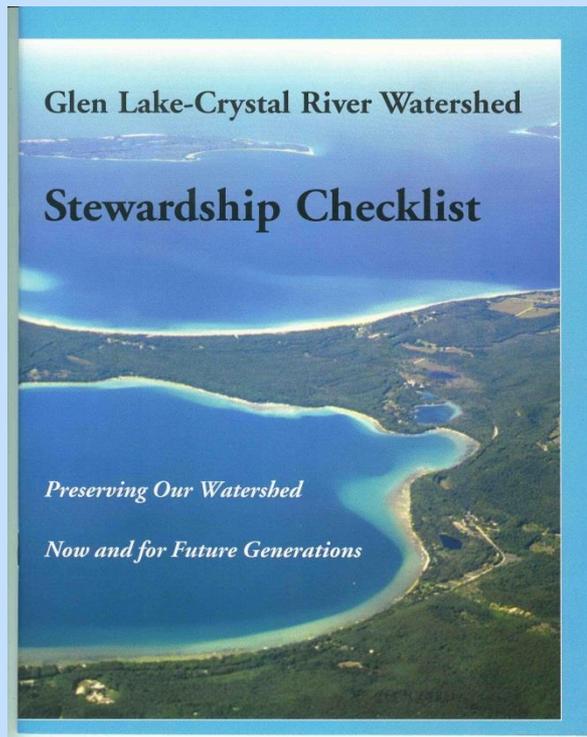
Stewardship and Our Shoreline Survey

As Watershed Residents and
Riparians, are we doing what we
can to protect our valued
resource?

We Protect our Watershed Through
Comprehensive Stewardship Practices

Shoreline Survey

An evaluation of our stewardship effectiveness



The survey Considers 6 of the 24 good stewardship practices listed in our Glen Lake-Crystal River Watershed Stewardship Checklist

Glen Lake Association Shoreline Survey

A Study to Enhance Protection
of our Treasured Resource



We wanted answers to these questions:

- How are we doing toward protecting our waters from nutrient and sediment inflow?
- How much shoreline erosion are we experiencing?
- What shoreline practices should we focus on to guard against identified threats?

Glen Lake Shoreline Survey

- We used the same survey protocol as the Torch Lake Survey in 2008 -2009
- Big and Little Glen Surveyed
- Administered by Rob Karner, Glen Lake Watershed Biologist
- Funded by the Glen Lake Association
- 682 shoreline properties surveyed – 17 miles of shoreline
- 5 GLA volunteers and Rob Karner were the surveyors

Volunteers:

Bruce Lichliter
June Powley
Gerry Powley

Sarah Litch
Mike Litch

Greenbelt Buffer Rating System

Points added for Total Score

Greenbelt Length	None 0	<10% 1	10-25% 2	25-75% 3	>75% 4
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Greenbelt Avg. Depth	None 0	<10' 1	10-40' 2	>40' 3
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Turf	>75% -4	25-75% -3	10-25% -2	<10% -1	0% 0
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Greenbelt Density	None 0	Sparse 1	Medium 2	Dense 3
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Species Diversity	Uniform 1	Several 2	Many 3
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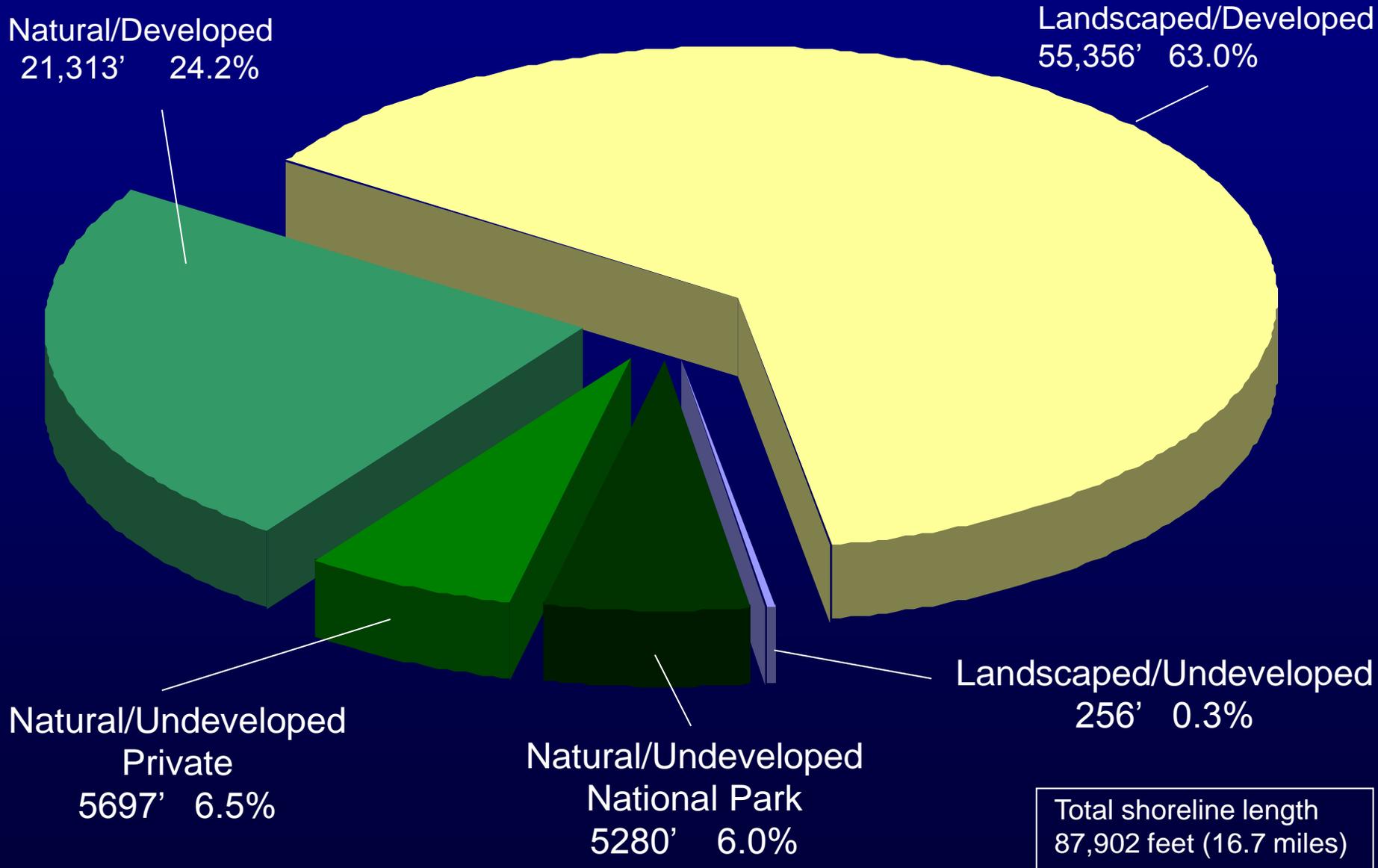
Erosion	None 0	Minor -1	Severe -2
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Erosion Control Structures	Sea Wall -3	Riprap -2	Biotechnical -1
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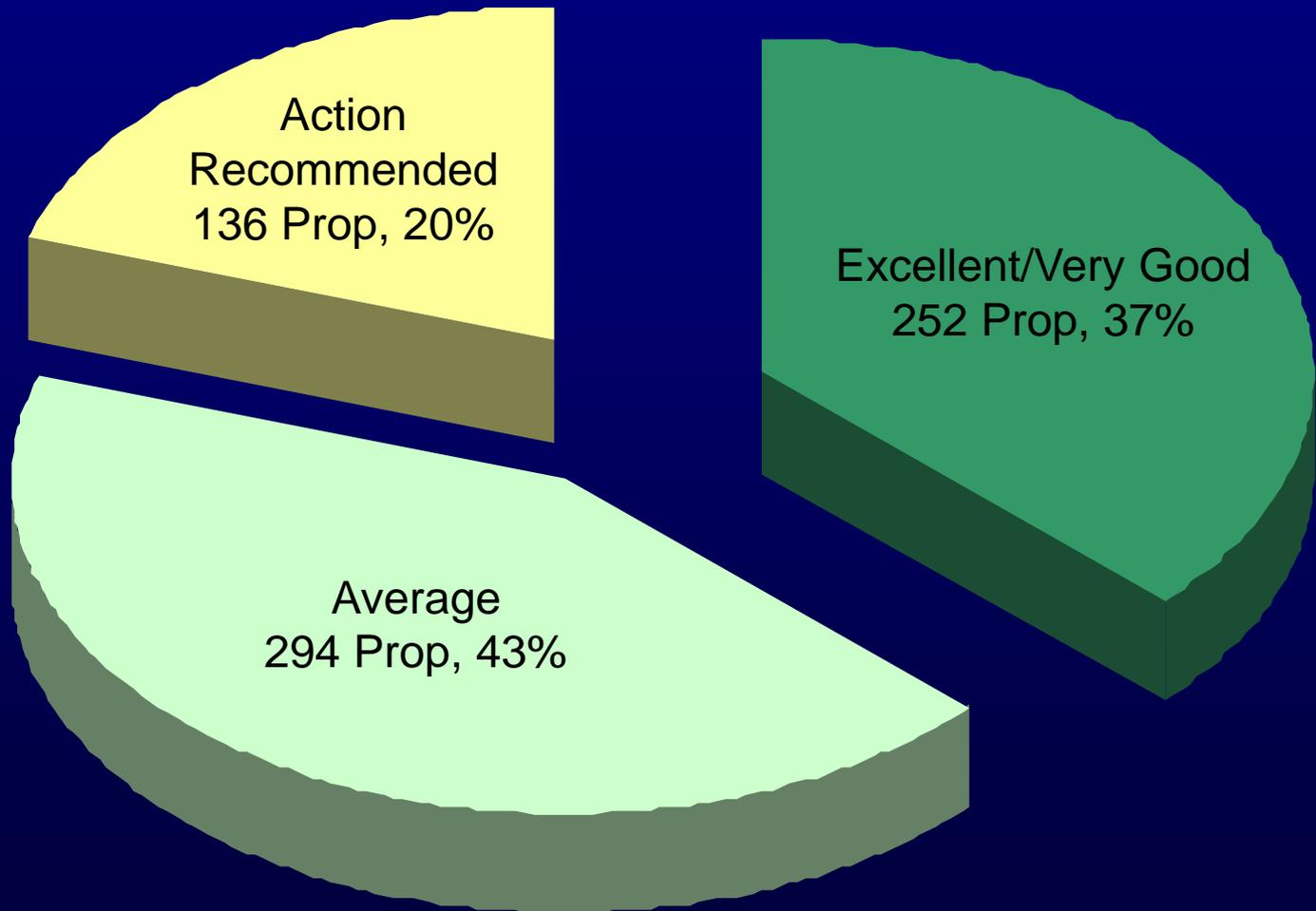
Vertical Structures	All 3	Groundcover 1	Understory 1	Overstory 1
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Total Rating	Action Recommended	Average	Excellent/ Very Good
	-9 to 0	1 to 9	10 to 16

Shoreline Naturalization Frontage Feet – Big and Little Glen

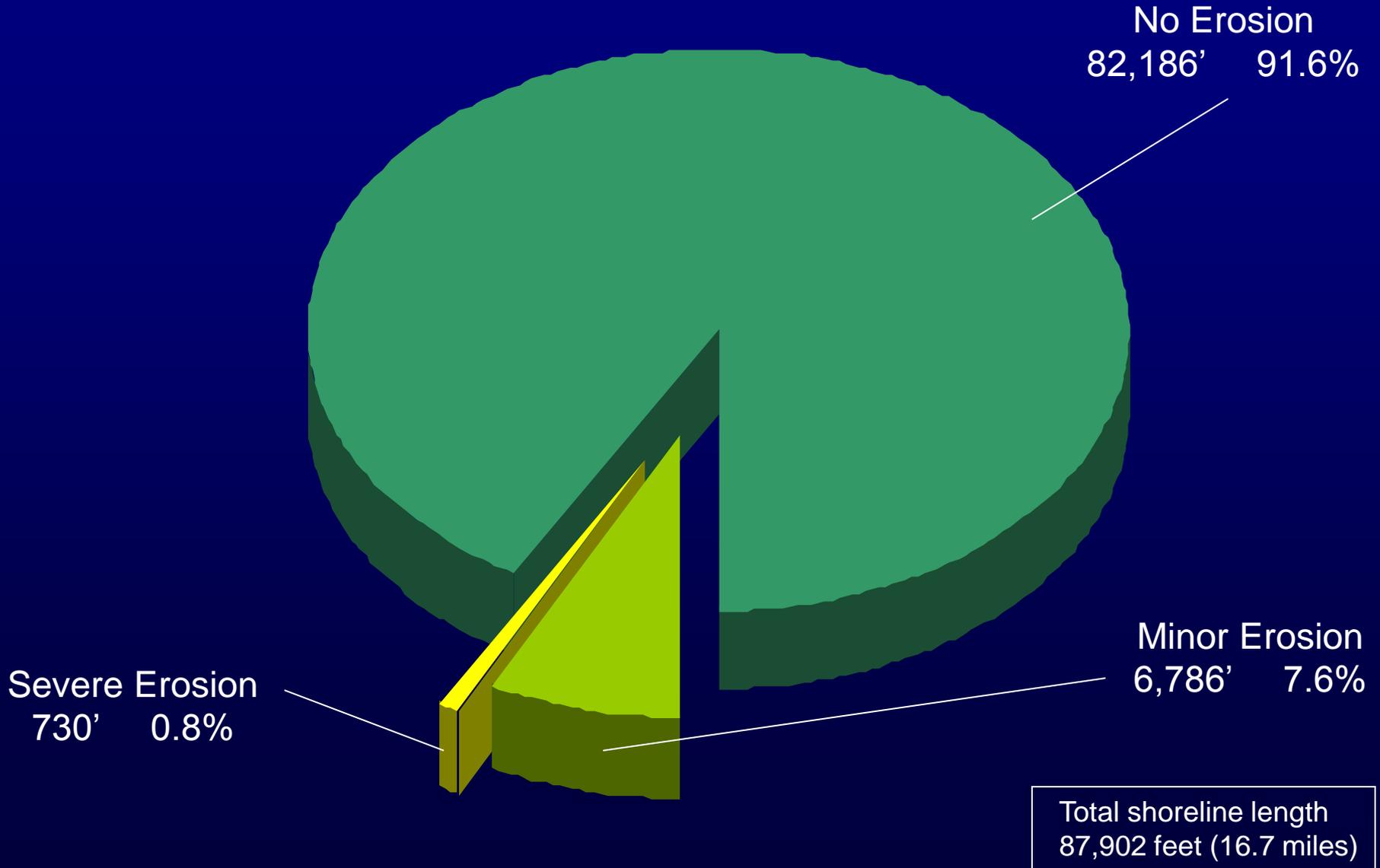


Greenbelt Buffer Survey Results by Category



Total Number of Shoreline Properties Surveyed - 682

Shoreline Erosion Frontage Feet



What can we do to improve our shorelines?

Your Glen Lake Association can help!

Property owner's can:

- First – Check with Rob Karner, our watershed biologist, to determine your overall shoreline rating.
- Second – If there is factor that reduces your overall rating, and you want help to correct an identified opportunity for improvement, call and schedule a session with Rob.
- Third – Rob will re-check the ratings originally determined and suggest changes if warranted. Documented plans can be furnished by the GLA if desired.

Greenbelt Buffers Help keep Plant Nutrients and Sediment out of the Lake

~~Phosphorus~~

It doesn't make sense to fertilize the algae and
Plants in our lakes!

These nutrients feed:

- Blue Green Algae (toxic microcystin)
- Cladophora and other slimy filamentous algae
- Non-native invasive aquatic plants
- Excessive native plant growth

We can help control these plants by not encouraging them.

How can we minimize fertilization of the lake?

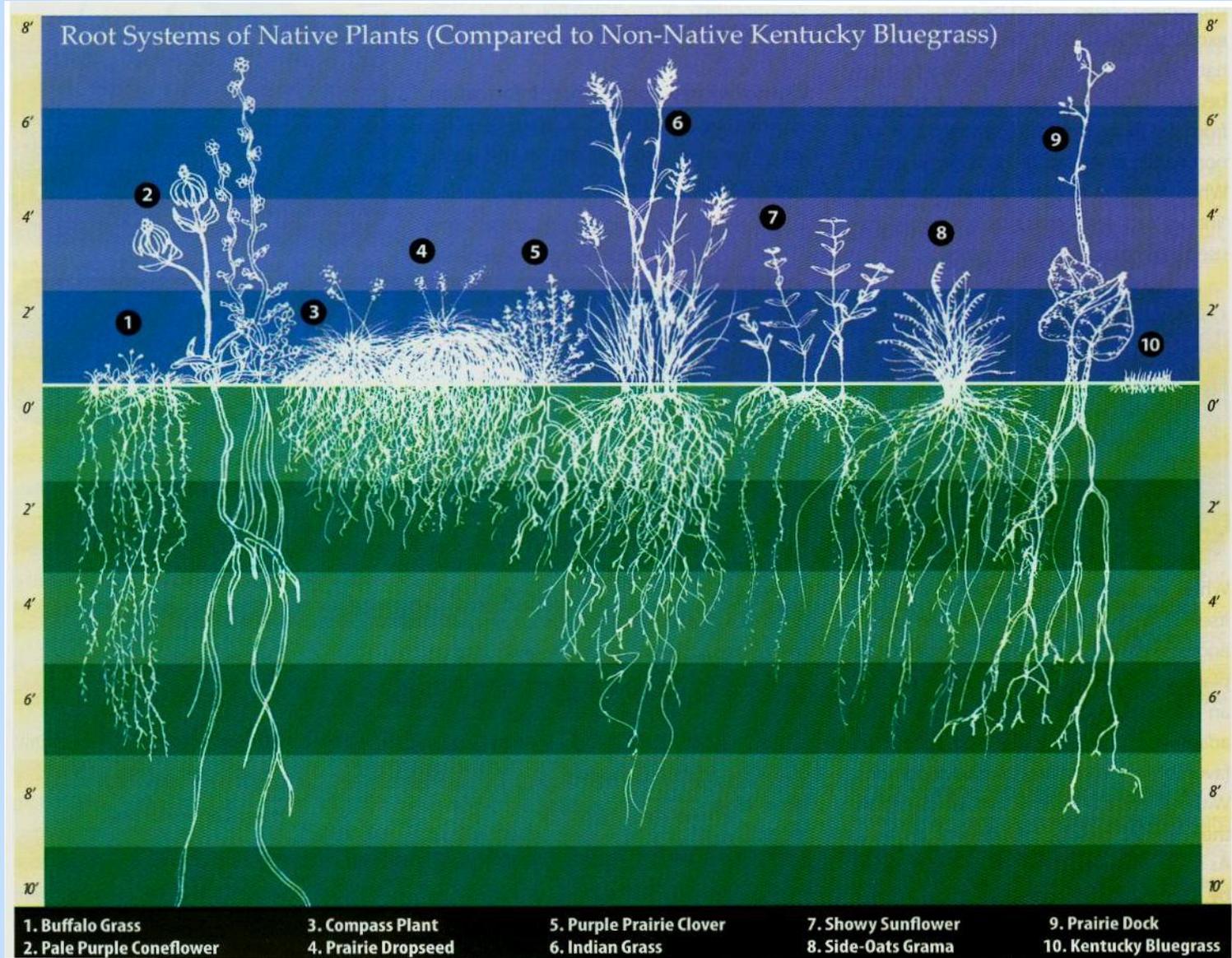
- Have regular septic maintenance
- Avoid fertilizing your lakeside lawn
- Use non-phosphorus fertilizer; away from lakes, river or streams
- Discourage waterfowl
- Have greenbelt buffers with deep rooted plants or trees, setback lawns or no lawns

- Use non-phosphate soaps (laundry and dish washer soap)
- Minimize impervious surfaces on property
- Direct rainwater to catchments or deep rooted plant areas
- Water yard vegetation with lake water
- Keep yard waste (grass clippings and leaves) out of the lake

How can we prevent or stop shoreline erosion?

- Greenbelt Buffers with deep rooted plants, bushes, and trees

Deep Rooted Plants





How can we prevent or stop shoreline erosion?

- Greenbelt Buffers with deep rooted plants, bushes, and trees
- Encourage emergent vegetation, e.g. bulrushes



How can we prevent or stop shoreline erosion?

- Greenbelts with deep rooted plants, bushes, and trees
- Encourage emergent vegetation, e.g. bulrushes

For really tough erosion conditions use:

- Live red osier or willow plantings



How can we prevent or stop shoreline erosion?

- Greenbelt Buffers with deep rooted plants, bushes, and trees
- Encourage emergent vegetation, e.g. bulrushes

For really tough erosion conditions use:

- Live red osier or willow plantings
- Geotechnical landscaping cloth





(ABOVE) In 2000, start of restoration along Lake Phalen in St. Paul. (RIGHT) View of the same site in 2002.

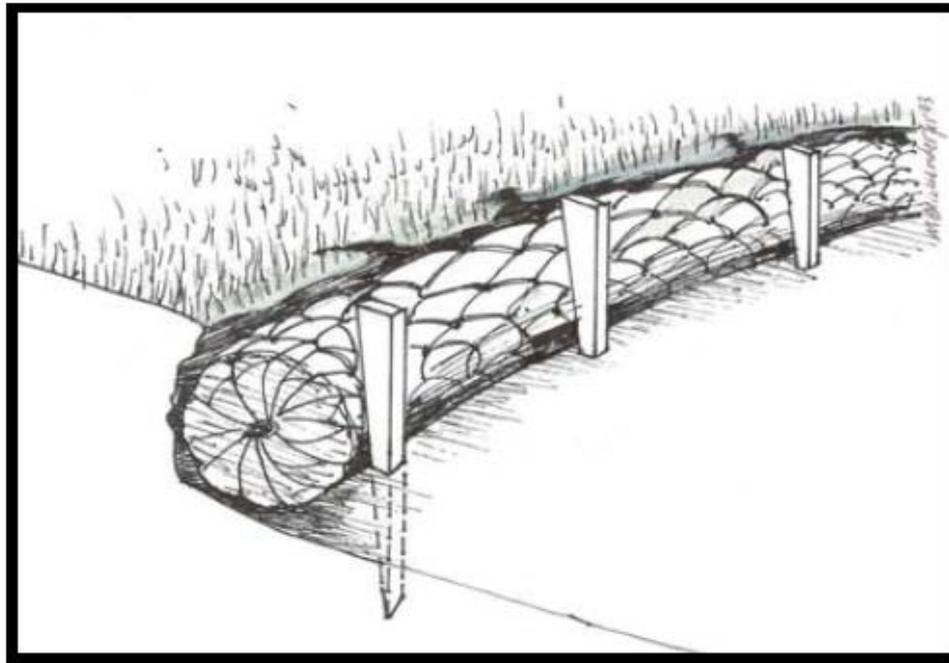


How can we prevent or stop shoreline erosion?

- Greenbelt Buffers with deep rooted plants, bushes, and trees
- Encourage emergent vegetation, e.g. bulrushes

For really tough erosion conditions use:

- Live red osier or willow plantings
- Geotechnical landscaping cloth
- Coconut bundle logs

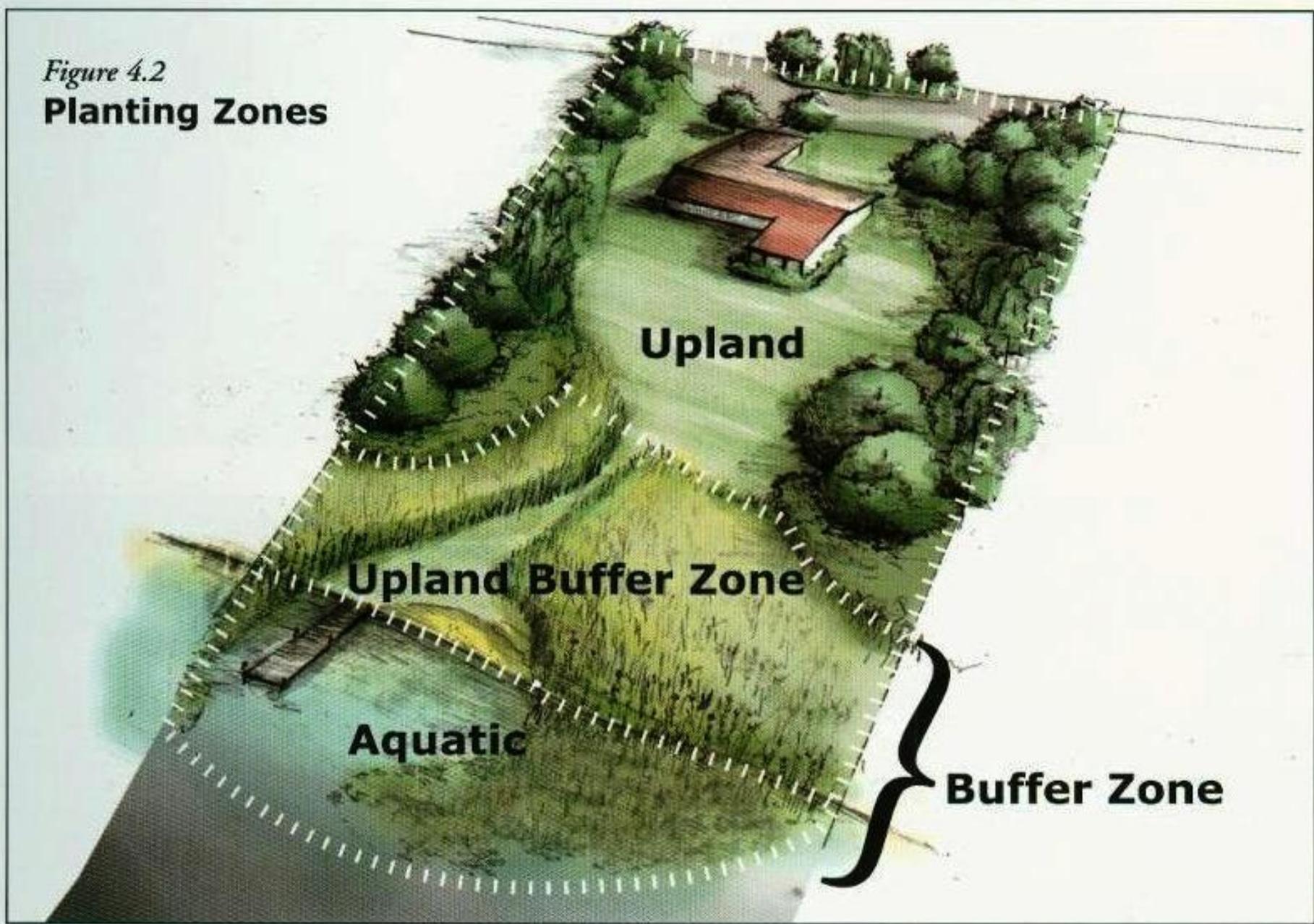


FIBER LOGS

What are fiber logs?

Fiber logs are made of compressed coconut fiber surrounded by a mesh tube. The logs are usually 20' long and 12" in diameter.

Figure 4.2
Planting Zones



LAKESCAPING FOR WILDLIFE AND WATER QUALITY



Nongame Wildlife Program — Section of Wildlife
Minnesota Department of Natural Resources